

APOLLO PROGRAM DIRECTIVE NO. 34

MA

TO : Distribution

FROM: G. W. Dyer, Jr.  
APOLLO PROGRAM DIRECTOR

SUBJECT : Apollo Program CCB Controls and Requirements

- SECTION I - CRITERIA AND PROCEDURES FOR CHANGES  
REQUIRING LEVEL I CCB APPROVAL
- SECTION II - ELEVATION OF CHANGE APPROVAL AUTHORITY
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DIRECTOR
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CHANGES AT KSC

OFFICE OF PRIME RESPONSIBILITY (OPR): Apollo Program Control (MAP)

- REFERENCES:
- (a) NPC 500-1, Apollo Configuration Management Manual,  
May 18, 1964.
  - (b) SE-005-001-1 Rev. A, Apollo Program Specification,  
March 1966 (Confidential).
  - (c) SE-010-000-1, Apollo Flight Mission Assignments,  
(effective issue) (Confidential).
  - (d) M-D-MA-1400.005, Apollo Program Directive No. 4  
(series) Apollo Program Schedule and Hardware Plan-  
ning Guidelines and Requirements, (effective issue)  
(Confidential).
  - (e) NHB 8080.1, Apollo Test Requirements, September 30,  
1966.
  - (f) M-S-ML-3200.033, Apollo Program Directive No. 18,  
Changes to Apollo Hardware and Software for Saturn/  
Apollo Applications, May 4, 1966.

I. PURPOSE

To consolidate and augment change approval controls and requirements, including reports, which have evolved during the prosecution of prior phases of the Apollo Program. This Directive supplements reference (a) in the areas covered herein.

APPLICABILITY

This Directive is applicable for Apollo Mission No. 6 and subsequent. Center Apollo Program Managers shall institute procedures to implement this Directive where such procedures are not already established.

III. CANCELLATION

The following are superseded and cancelled:

M-D-MA-1400.023, APD #14, Change Control of Apollo Space Vehicles at KSC, January 6, 1967.

M-D-MA-1400.063, APD #28, Apollo Program Director Level I Change Approval Requirements, June 16, 1967.

SECTION ICRITERIA AND PROCEDURES FOR CHANGES  
REQUIRING LEVEL I CCB APPROVALA. APPLICABILITY

All proposed changes falling within the criteria set forth below must be submitted to the Apollo Program Director's Level I CCB for approval. Also, included in this SECTION are provisions amplifying and implementing the elevation of approval authority to Level I CCB in accordance with SECTION II, paragraph B.1 for all changes after FRT/CDDT, (whichever occurs first for the mission under consideration).

B. CRITERIA

Approval by the Apollo Program Director (Level I CCB) is required for all changes or program actions meeting the following criteria:

1. General Requirements

- a. Any change to Apollo hardware, software, or facilities which will or may result in the inability to meet:
  - (1) the performance, safety, reliability, design and other technical requirements established in the Apollo Program Specifications (Ref. b),
  - (2) the mission objectives, profiles, payload requirements, space vehicle configuration and other requirements in the Flight Mission Assignments Document (Ref. c),
  - (3) the launch dates, hardware and software delivery dates, hardware quantities, and other controlled requirements established in the Program Schedules and Hardware Planning Guidelines and Requirements (Ref. d), and
  - (4) the minimum system compatibility tests, all-systems tests, ground qualification tests, ground equipment checkout tests, space vehicle checkout tests, and flight verification tests and other minimum test requirements in the Apollo Test Requirements (Ref. e).
- b. Experiments  
Any change in a Manned Space Flight Experiment Board-approved experiment after the initial assignment has been made by the Apollo Program Director.
- c. Inter-Center Changes  
All inter-Center changes which do not otherwise meet Level I criteria but cannot be resolved to the mutual satisfaction of Centers concerned.

## B. CRITERIA (cont'd)

d. Saturn/Apollo Applications

Any changes to Apollo Program end items to meet the requirements of the Saturn/Apollo Applications Program (Ref. f). (Procedures for requesting change approval for these changes will be the same as for the Routine Procedure set forth in paragraph C. 1.a below).

e. Other Changes

Other change categories may be elevated to Level 1 as determined necessary by the Program Director. In these instances, the required direction will be implemented and, if applicable, this directive will be revised. Temporary elevations of change authority will not be incorporated in this directive.

2. Post FRT/CDDT Changes at KSC

Changes which are to be incorporated between FRT/CDDT and Launch become Level 1 changes to be approved or revalidated by the Mission Director acting for the Program Director prior to incorporation. Coordination requirements are set forth in paragraph C. 2 below. Changes subject to this control are:

- a. All changes proposed between FRT/CDDT and Launch.
- b. Revalidation of those changes, to the Space Vehicle and supporting functional GSE and ESE, approved prior to FRT/CDDT for which incorporation scheduling has not been provided during the post FRT/CDDT Launch preparations.
- c. Procedural changes which are defined as changes to procedures which change philosophy or intent to the extent the FRT/CDDT may be invalidated. These changes will be acted upon in accordance with Apollo Program Directive No. 26, "Preparation of Test and Checkout Plans and Procedures at KSC," and its implementing KSC Launch Operations Directive No. 6, "Preparation and Management of Apollo/Saturn Test and Checkout Procedures (TCP's)."
- d. Changes to Mission Rules other than administrative and typographical corrections.

C. PROCEDURES1. Prior to FRT/CDDT

At any time prior to FRT/CDDT, procedures for requesting approval of Level 1 changes identified in the criteria of paragraph B. 1 are:

a. Routine Procedure

Apollo Program Managers at their respective Centers shall submit to the Apollo Program Director change requests which include results of prior coordination with affected Centers, an assessment, recommendation, and the change package requirements called for in SECTION III to this Directive.

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C. PROCEDURES (cont'd)b. Expedited Change Procedure

In the case of either emergency or urgent changes interim approval may be requested from the Apollo Program Director or from his Deputy by telephone or TWX, with the change package to follow in all cases.

- c. Changes to space vehicles at KSC which impact a launch date or mission objectives are "urgent" changes. Interim approval will be requested from the Apollo Program Director or his Deputy by telephone or TWX, with the change package to follow in all cases.

2. Post FRT/CDDT

Approval of changes described in B.2 above will be requested from the Apollo Mission Director who is delegated with the change approval authority of the Apollo Program Director during this period. In implementing this requirement, the following apply:

- a. Each Center shall forward an annotated list (with necessary details) to the Mission Director covering those changes approved prior to FRT/CDDT and either in process of being installed or yet to be installed.
- b. Potential changes under consideration by MSC or MSFC will be routed to the Mission Director for his review simultaneously with routing to KSC. Should the Mission Director not concur with the proposed change, he will direct KSC to discontinue all activities with respect to the subject change.
- c. Except for the assessment by the Mission Director as per b. above, usual Level II inter-Center change procedures shall apply, with final approval by the Mission Director.
- d. Changes, including Field Engineering Changes (FEC's) shall receive expedited handling and may be submitted by telephone to the Mission Director or his Deputy with formal written action to follow. (In the case of FEC's, KSC may approve and authorize installation without prior approval of the Mission Director if required by schedule, and after reasonable effort has been made to obtain verbal approval. The Mission Director shall be informed within 24 hours of each such case.)
- e. Each Center shall designate a single point of contact through which change request processing will be funneled to and from the Mission Director.

The Apollo Program CMO will support the Mission Director and shall be a focal point for information flow and documentation of changes in the Mission Director's Office at KSC.

SECTION II

ELEVATION OF CHANGE APPROVAL AUTHORITY

A. APPLICABILITY

This SECTION is applicable to all Level II and Level III CCB's.

B. ACTION

1. Elevation to Level I

All changes which are to be incorporated between FRT/CDDT (whichever occurs first for the mission under consideration) and launch become changes to be approved or revalidated by the Apollo Program Director. During this interval preceding launch, the Mission Director at KSC is delegated approval authority by the Program Director. SECTION I, paragraphs B.2 and C.2 amplify the scope of this elevation and associated procedures.

2. Elevation of Level III CCB Change Approval

The following requirements affecting Level III CCB change approval are effective for Apollo Mission 6 and subsequent.

- a. At the times specified below, all changes within the approval authority of Level III CCB's will thereafter be approved at Level II for the mission under consideration by the cognizant Center's Apollo Program Manager or his Deputy.
  - (1) For the Launch Vehicle stages and the IU, elevation will occur at MSFC turnover to KSC.
  - (2) For the Lunar Module, Command Module and Service Module, elevation will occur at the Phase III CARR of each module.
  - (3) For MSFC, MSC, and KSC Launch Support Equipment, elevation will occur 120 days prior to each mission launch date.
- b. Commencing at the time of the elevation to Level II, all change requests submitted by KSC to MSC or MSFC, shall be approved by the KSC Apollo Program Manager or his Deputy prior to submission.
- c. Field Engineering Changes and Expedited ECP's originated at KSC for the correction of emergency situations after elevation of change approval to Level II CCB's may be implemented upon approval of the cognizant MSFC or MSC Senior Resident Manager at KSC. As soon as possible thereafter, the FEC or Expedited ECP shall be followed by a formal ECP. One ECP shall be prepared for each FEC or Expedited ECP.

An emergency situation exists when an engineering change is required to:

B. ACTION (cont'd)

- (1) prevent bodily harm
  - (2) prevent serious damage to equipment
  - (3) complete a scheduled test, the delay of which would seriously impact the ability to comply with program commitments or schedule milestones.
  - (4) prevent a shutdown when the shutdown would impact the ability to meet program commitments or schedule milestones.
- d. At the time of the elevation of change approval authority to Level II as required by paragraph (a), each Center will commence submission of a "Weekly Status Report of Changes" to the Apollo Program Office CMO (MAP-6). This report will be sent by DATAFAX and will consist of three parts in the format of paragraph C. below.

Should the Launch Date slip after the actions required in paragraphs a., b., c., d., above have been initiated for a specific Mission, they shall be continued until relief from the requirement is granted by the Apollo Mission Director.

C. REPORT FORMAT

1. An individual report shall be submitted for each Apollo Mission. The information or its equivalent will be provided in accordance with the recommended format below.

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ATTN: APO CMO (MAP-6)  
SUBJ: Weekly Status Report of Changes Apollo Mission  
No. \_\_\_\_\_  
For Week Ending \_\_\_\_\_ (date) \_\_\_\_\_

## PART I - CHANGES APPROVED DURING REPORT WEEK

1	2	3	4	5	6	7
CENTER	CCBD	CCBD	CATEGORY	EST.	CHANGE	CONSEQUENCE OF
CHANGE	NO.	DATE		INSTALL.	DESCRIPTION	NOT INCORPORATING CHANGE
NUMBER				M-HRS		

## PART II - UNINCORPORATED CHANGES

## PART III- CHANGES INCORPORATED SINCE LAST REPORT

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C. REPORT FORMAT (cont'd)

## 2. Explanatory Notes:

- a. Subj: - Fill in Mission Number and date.
- b. Part I
  - Col. 1 - Use the ECP, RECP, CR or other number used by Center to identify the change (i.e., ECP 325)
  - 2 - Self explanatory
  - 3 - Self explanatory
  - 4 - Identify category of change by numeral for categories listed below. Additional categories as required shall be written out.
    - Category No.
    - 1. Mandatory to Meet Mission Objectives
    - 2. Required by Approved Safety Regulations
    - 3. Implements CARR/FACI/FRR/MRR Action
    - 4. Mandatory for Continued GSE Support
    - 5. Correct Qualification Failure
    - 6. Replacement of Failed Component
    - 7. Mandatory for Crew Safety
    - 8. Implements Previously Reported MSC/MSFC/KS Approved Change
    - 9. Apollo Program Direction
    - 10. Fit Adjustment
    - 11. Record Change
    - 12. Non-Mandatory
  - 5 - Provide best estimate of man-hours to install.
  - 6 - Brief one sentence description of change.
  - 7 - Self-explanatory
- c. Part II
  - List by Center Change number. Unincorporated changes will continue to be reported in Part II on each weekly report until the change is incorporated (closed out) and reported in Part III.
- d. Part III
  - List by Center Change numbers. Once reported no further reporting of that particular change number is required in this Weekly Report.

Attachment A: Chart - Elevation of Change Approval Authority



ELEVATION OF CHANGE APPROVAL AUTHORITY  
(REF: APD 34, SECTION II, PARA. B.)

ATTACHMENT A  
APOLLO PROGRAM DIRECTIVE 34

LEVEL I CCB

LEVEL II CCB

LEVEL III CCB

CHANGES PREVIOUSLY  
WITHIN APPROVAL AUTHOR-  
ITY OF LEVEL III CCBS  
→ REQUIRE LEVEL II CCB  
APPROVAL →

ALL CHANGES REQUIRE  
LEVEL I CCB APPROVAL  
(MISSION DIRECTOR AT  
KSC DELEGATED APPROVAL  
AUTHORITY BY PROGRAM  
DIRECTOR) →

ELEVATION TO LEVEL II FOR  
--LV STAGES & IU AT MSFC TURN  
OVER TO KSC  
--CM, SM, LM AT PHASE III CARR  
--LAUNCH SUPPORT EQUIPMENT AT  
LAUNCH MINUS 120 DAYS

FRT/CDDT  
(WHICHEVER OCCURS FIRST)

LAUNCH

SECTION III

CHANGE PACKAGE REQUIREMENTS

**A. ACTION**

Each Change Package submitted to the Level I CCB for evaluation and disposition shall include the following:

**1. Hardware Changes**

- a. The Engineering Change Proposal (ECP) completed in accordance with ANA 445.
- b. A letter of transmittal signed by the Center Apollo Program Manager.  
The transmittal letter shall include:
  - (1) Basis for submittal to Level I CCB and urgency of required action;
  - (2) A statement as to whether the change is mandatory for safety reasons or for mission accomplishment, and why;
  - (3) If the change is not mandatory, a brief statement of why approval is recommended;
  - (4) Statement of coordination with other affected Centers.
- c. The Level II Configuration Control Board Directive (CCBD) showing approval or disapproval of the change.
- d. All significant back-up data used by the Center Level II CCB in formulating a decision or recommendation.  
Back-up data should include, but not be limited to, the following:
  - (1) The initiating means for change action, if other than the enclosed ECP. Examples: Center Engineering Change Request or letter of recommendation from a Center Director.
  - (2) The basis for evaluation and decision by Center CCB.
    - (a) Engineering assessment of change by responsible office(s);
    - (b) Specification Change Notices. Separate SCN's shall be included for each specification affected by the change. Each SCN shall identify the paragraph(s) to be changed and provide the recommended revised wording. In the event that no specification is affected by the change, an SCN form shall be provided with the statement "No Specification Affected." All specifications shall use a Specification Change Log to report contractually authorized SCN's at the ECP's from which they were generated. At the discretion of the applicable CMO, specification replacement pages may accompany the SCN;

SECTION IV

SUBMISSION OF CCBD'S TO APOLLO PROGRAM DIRECTOR

A. APPLICABILITY

This SECTION is applicable to all Level II and III CCB's.

B. ACTION

1. The Apollo Program Office CMO (MAP-6) shall be placed on the distribution list for a copy of all Level II and Level III CCBD's. Each week, Centers shall forward CCBD's accumulated during the preceding week. Submission shall be made on a continuing basis irrespective of space vehicle or mission effectivity, and is independent of the Level III CCB elevation and the weekly status report required by SECTION II, paragraph B.2.
2. CCBD's thus provided will be used to increase visibility of the Program Director in respect to trends in types and numbers of changes, assist in tracking of configuration differences, and to provide information for periodic reports to the Associate Administrator, Office of Manned Space Flight.

A. ACTION (cont'd)

- (c) Preliminary Interface Revision Notices (PIRN's) for Level A ICD's which must be changed because of the hardware change;
  - (d) Cost estimate for total change implementation;
  - (e) Appropriate drawings, schematics, sketches, photographs or other material which will clarify and assist in understanding the recommended change. Emphasis shall be placed on demonstrating the necessity for the change and the consequences of not making the change;
  - (f) Alternate solutions to the problem including advantages and disadvantages of alternate solutions;
  - (g) Schedule impact;
  - (h) Software impact.
- 2. Software Changes  
Changes to either the program or computer tapes shall comply with the ANA 445 format to the fullest possible extent and the provisions of paragraph 1 above, as applicable.
- 3. Documentation Changes
  - a. Proposed changes to Level A Interface Control Documents (ICD's) or the Apollo Program Specification which are not the result of a hardware change or will not result in a hardware change will be submitted by a Requirements ECP prepared in accordance with NPC 500-1, Exhibit VIII, Para. 6.3. Particular emphasis will be placed on describing the reason for the change (e.g., "as built" does not meet documentation requirements; however, hardware "as tested" satisfies operational requirements, etc.).
  - b. A letter of transmittal signed by the Center Apollo Program Manager. The transmittal letter will include:
    - (1) Basis for submittal to Level I CCB and urgency of required action;
    - (2) Statement of coordination with other affected Centers;
    - (3) Citation of specific paragraphs of the Apollo Program Specification and the essential changes which are proposed;
    - (4) Statement of estimated program schedule and cost impact of not approving the proposed change.
  - c. Level II CCB and associated change package.
  - d. Preliminary Interface Revision Notices (PIRN's) for proposed ICD changes.
- 4. Changes to Controlled Milestone Schedules and Hardware Quantities. Proposed changes to controlled milestone schedules and hardware quantities which are set forth in reference (d) will be submitted in accordance with procedures established in reference (d). Milestone changes resulting from hardware changes will be included in the hardware change package defined in 1. above.

SECTION VCONTROL OF OPEN WORK AND HARDWARE CHANGES AT KSCA. APPLICABILITY

This SECTION is applicable to all Space Vehicle hardware and supporting GSE furnished by MSC and MSFC from time of delivery at KSC to launch. The policies stated in paragraph B. below, were included heretofore in APD 14.

B. ACTION

Center Apollo Program Managers shall establish procedures to implement the following:

1. Open Work At KSC

As a matter of policy, all hardware will be completed at contractors' plants prior to delivery to KSC. It is recognized, however, that there are circumstances where it is to the advantage of the Program to deliver hardware with work remaining to be completed at KSC. Such remaining "open work" can affect realistic planning and adherence to integrated daily work schedules at KSC. To ensure proper consideration of this factor in the planning and execution of KSC's responsibilities in meeting established launch dates, KSC shall be a party to decisions prior to delivery of Space Vehicle and supporting GSE hardware with "open work" remaining to be accomplished at KSC.

2. Hardware Changes At KSC

After arrival of Space Vehicle and supporting GSE hardware at KSC, the responsibility for controlling changes remains with MSFC for Launch Vehicle and MSC for Spacecraft except as KSC has been specifically delegated change authority by MSFC and MSC.

a. As required by SECTION I, paragraph B.1., when proposed changes to any space vehicle hardware at KSC have an impact on the established launch date or planned mission objectives, these changes are considered to be Level I, and as such must be submitted to the Apollo Program Director for his approval.

b. Evaluation as to whether a proposed change affects schedules should be based on impact on the following key milestones at KSC:

- (1) Applying power to launch vehicle
- (2) Spacecraft mechanical and electrical mating to launch vehicle
- (3) Space Vehicle overall test
- (4) Countdown demonstration test (CDDT)
- (5) Launch date